

CLAIMS

We Claim:

- 5 1. An isolated polymer comprising chitosan bound to a glutamine residue of a polypeptide.
2. An isolated polymer comprising chitosan bound to a tyrosine residue of a polypeptide.
- 10 3. The polymer of claim 1 or 2, wherein the polypeptide is not a polypeptide that is covalently bonded to chitosan in surimi.
4. The polymer of claim 1 or 2, wherein the polypeptide is gelatin.
- 15 5. The polymer of claim 1 or 2, wherein the polypeptide is 2-5 amino acids in length.
6. The polymer of claim 1 or 2, wherein the polypeptide is 6-20 amino acids in length.
- 20 7. The polymer of claim 1 or 2, wherein the polypeptide is at least 21 amino acids in length.
8. The polymer of claim 1 or 2 wherein the polymer is chitosan covalently bonded to one or more polypeptides, a polypeptide covalently bonded to one or more chitosan, or a combination thereof.
- 25 9. The polymer of claim 8 wherein the chitosan is bound to two or more polypeptides of different types.
- 30 10. A composition comprising a polysaccharide, a polypeptide and an enzyme, wherein the enzyme is transglutaminase or tyrosinase.

11. A method of making a polymer, which comprises contacting a polypeptide and a polysaccharide with a transglutaminase under conditions sufficient to bind the polypeptide to the polysaccharide, wherein the polypeptide comprises a glutamine residue.

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12. A method of making a polymer, which comprises:

contacting a polypeptide comprising a glutamine residue with transglutaminase to yield a modified polypeptide; and

10 contacting the modified polypeptide with a polysaccharide under conditions sufficient to bond the polysaccharide to the modified polypeptide.

13. A method of making a polymer, which comprises contacting a polypeptide and a polysaccharide with a tyrosinase under conditions sufficient to bind the polypeptide to the polysaccharide, wherein the polypeptide comprises a tyrosine residue.

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14. A method of making a polymer, which comprises:

contacting a polypeptide comprising a tyrosine residue with tyrosinase to yield a modified polypeptide; and

20 contacting the modified polypeptide with a polysaccharide under conditions sufficient to bond the polysaccharide to the modified polypeptide.

15. The method of one of claims 10-14, wherein the polypeptide is gelatin.

16. The method of one of claims 10-14, wherein the polysaccharide is chitosan.